

WHAT IS CLAIMED IS:

1. A method for providing parameter estimation for multi-user detection systems in which the received signals are provided with training sequences, comprising the steps of:

detecting the channel characteristics from a first received signal and deriving parameter estimations for the first signal therefrom;

using the parameter estimations associated with the first signal in combination with the training sequence of the first signal to recreate a signal only due to the first signal; and

subtracting out the recreated first signal from the total received to obtain all parameters needed for the second signal using traditional parameter estimation techniques.

2. In a multi-user detection system in which interfering signals are purposely allowed to exist, a parameter estimation unit for use in conjunction with a signal separation unit, comprising:

a signal processor for determining the channel transfer functions for each received signal;

and,

means coupled to said channel transfer function determining signal processor for providing uninterrupted estimates of the channel transfer function parameters on a real-time basis.

3. The parameter estimation unit of Claim 2, wherein said multi-user detection system includes a base station with a base station clock having a clock frequency offset, and wherein said channel transfer function parameters include for each received signal at least one of received power, oscillator phase of the oscillator used to produce an interfering signal, timing offset relative to the base station clock frequency offset, number of multi-path replicas and delays for each replica.

4. The parameter estimation unit of Claim 3, wherein the estimated parameters are obtained by first deriving the estimated channel function for each interfering signal.

5. The parameter estimation unit of Claim 2, wherein the multi-user detection system includes providing an acquisition channel, and wherein the first derived estimated channel transfer function is derived from acquisition channel parameters.

6. The parameter estimation unit of Claim 2, wherein said multi-user detection system includes a tracking unit for acquired signals, and wherein in the presence of a new signal in the acquisition channel said parameter estimation unit estimates the channel transfer function prior to signal switching from the acquisition channel to the traffic channel, with said parameter estimation unit parameters being passed to said tracking unit thereafter.

7. The parameter estimation unit of Claim 6, wherein for said traffic channel phase is tracked without utilization of the estimates from the acquisition channel.

8. The parameter estimation unit of Claim 7, wherein all received signals have training portions, and wherein for a second interfering signal detected by said base station and assigned to said traffic channel, said parameter estimation unit recreates the training signal portion of every received signal prior to the last received signal and subtracts the recreated training signals from the training portion of the last received signal to provide an estimate solely due to the last received signal during the training signal portion, thus to allow an estimate of the last signal from which to calculate parameters of the last signal.

9. The parameter estimation unit of Claim 2, wherein after initial estimate generation, said multi-user detection system simultaneously tracks all signals in said traffic channel.

10. The parameter estimation unit of Claim 9, wherein said simultaneous tracking includes blocks for parallel recreation of the training signal portions of the traffic channel signal, each parallel processing block isolating a different signal in said traffic channel.

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